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THE ZOOLOGY OF THE SNAKE PLAINS OF IDAHO.

BY C. HART MERRIAM.

The basin of the Snake River in Idaho is an undulating, sage-covered plain, stretching completely across the State in its widest part. It is crescentic in shape (with the convexity to the south) and measures about 600 kilometers (375 miles) in length by 120 to 160 kilometers (75 to 100 miles) in average breadth. Its boundaries on the north and east are everywhere sharply defined, consisting of rugged mountains rising more or less precipitously from the plain. In several places these mountains project southward in parallel ranges, like so many fingers, alternating with northward extensions of the plains, which occupy the valleys between them. Such valleys are those of Birch Creek and Lemhi River, Little Lost River, and Malade or Big Wood River. On the south and west the Snake Plains are not so well defined, passing southward into Utah and Nevada between irregular ranges of mountains, and westward and northwestward into Oregon and Washington, where they are continuous with the Malheur Plains and plains of the Columbia. The altitude of the basin along the course of Snake River is about 1,800 meters (nearly 6,000 feet) at the eastern end, and less than 900 meters (3,000 feet) at the western, and its sides rise on the north and south to the altitude of 2,000 or even 2,150 meters (approximately 6,500 to 7,000 feet), forming a broad trough whose general direction is east and west.

The dominant feature of the Snake River basin is sage plains—rolling, uninterrupted plains, rising so gradually from the bottom of the basin as to appear almost level, and stretching away in every direction as far as the eye can reach. The plains are everywhere arid. The few streams that reach Snake River by a surface course usually flow in lower channels and do not water the region on either side.

The surface rock which crops out here and there over the sage plains proper is dark basaltic lava. It appears in the form of irregular masses or beds, extensive lava flows, and in

a few instances of broken down craters, the largest of which, Big Butte, rises about 600 meters (2,000 feet) above the plain. Some of cañons of Big Butte support a growth of Douglas fir and Murray pine. The lava flows present great diversity of form; elevated ridges of rough rock irregularly fissured and with jagged edges alternate with smooth, flat domes, suggesting giant bubbles; nearly level stretches marked by wavelets and ripples which bend and double, spread out as if just escaped from a seething, tumultuous caldron, while in many places the thick crust has fallen in, leaving deep pits of circular or elliptical outline, exposing the mouths of dark caverns that extend to unknown depths and furnish homes to owls and bats and a multitude of nocturnal animals. This black lava or basalt overlies an earlier flow of porphyritic trachite, gray in color and much less firm in texture. The Great Shoshone Fall, commonly known as the "Niagara of the West," results from the cutting down of the river bed through the hard basalt to the softer trachite below.

In summer the heat is excessive, the thermometer frequently reaching 110° in the shade, while in winter the snow covers the ground, and icy winds sweep over the plain. The forms of life which inhabit the region, therefore are such as can endure great heat during the season of reproductive activity, and can avoid the cold of winter by migration or hibernation; or if they remain active throughout the year they are hardy species, able to withstand great extremes of temperature and humidity.

Most of the rivers which flow down through the mountain valleys disappear on reaching the plains, and the greater part of the water which reaches Snake River does so by subterranean channels. Hundreds of springs pour their waters into the lava cañons of Snake River, usually at or near the bottom, and many of them are of great size. In winter their temperature is considerably higher than that of the river. Crayfish, identified by Mr. Walter Faxon as *Astacus gambellii* Girard, abound in these warm springs and are much sought after by raccoons (*Procyon lotor*?) and a small shell, identified by Dr.

R. E. C. Stearns as *Fluminicola nuttalliana* Lea, is exceedingly abundant on stones in the same springs.

It is a common feature of the Snake Plains, as of many other arid parts of the West, that the rivers which do not sink cut for themselves deep channels with precipitous walls, their present beds being several hundred feet below the general surface level. Of this character are the grand lava cañons of Snake River itself and many of its tributaries, particularly on the south side. As a rule these cañons cannot be seen until their very brinks are reached, and it is not often that they can be crossed on horse-back.

The northern boundary of the Snake Plains is formed by the lofty mountains of central Idaho, and by that part of the main range of the Rocky Mountains which bends directly westward from the Yellowstone National Park. Three narrow parallel valleys penetrate the mountains of east-central Idaho in a northwesterly direction, carrying slender tongues of the sage plains all the way to Salmon River.

The soil of the Snake Plains, where not lava or sand, is generally alkaline, and the characteristic plants, in addition to the ever present sage (*Artemisia tridentata*), are such Sonoran species as *Atriplex confertifolia*, *Atriplex nuttallii*, *Artemisia pedatifida*, *Sarcobatus vermiculatus*, *Tetradymia canescens*, *Eurotia lanata*, *Eriogonum cernuum tenue*, several species of *Bigelovia*, a *Malvastrum*, and two or three kinds of cactus. *Artemisia trifida* and *Purshia tridentata* are common in the higher levels; and *Iva axillaris*, a saline species, was found at the sinks of Big Lost River.

The characteristic birds of the sage plains are sage sparrow (*Amphispiza belli nevadensis*), Brewer's sparrow (*Spizella brewerii*), sage thrasher (*Oroscoptes montanus*), burrowing owl (*Speotyto cunicularia hypogæa*), sage hen (*Centrocercus urophasianus*), and sharp-tailed grouse (*Pediocætes phasianellus columbianus*), though the latter is rare in the area traversed. Ravens (*Corvus corax sinuatus*) and magpies (*Pica pica hudsonica*) are common in places, and the cañon wren (*Catherpes conspersus*) was found near Shoshone Falls in the lava cañon of Snake River.

The most common diurnal mammals are the Great Basin or sage chipmunk (*Tamias minimus pictus*) and a small spermophile (*Spermophilus townsendii*). Other equally characteristic species are the nocturnal kangaroo rat (*Dipodops ordii*), pocket mouse (*Perognathus olivaceus*), grasshopper mouse (*Onychomys leucogaster brevicaudus*). Four species of rabbits, namely, the white-tailed and the black-tailed jack rabbits (*Lepus campestris* and *L. texianus*), the Idaho pigmy rabbit (*L. idahoensis*) here described for the first time, and the great basin cotton-tail (*L. silvaticus nuttallii*) are common. Antelope roam over the plain in small herds, and badgers and coyotes are abundant. In the lava cañon of Snake River, near Shoshone Falls, the plateau lynx (*Lynx baileyi*), raccoon (*Procyon lotor* ?), little striped skunk (*Spilogale saxatilis* ?), dusky wood rat (*Neotoma cinerea occidentalis*), and cliff mouse (*Hesperomys crinitus* sp. nov.) are common, and tracks of porcupine (*Erethizon epixanthus*) were seen. Black-tailed deer (*Cariacus macrotis*) inhabit the cañons in winter.

Rattlesnakes (*Crotalus lucifer*), horned toads (*Phrynosoma douglasii*), and small lizards (*Sceloporus graciosus*) are common on the Snake Plains, and extend north through the principal sage-covered valleys. Two Bull snakes, provisionally referred to *Pityophis catenifer* by Dr. Stejneger, were collected at Big Butte and Arco, and a single *Bascanion vetustum* at Big Butte.

Salmon and sturgeon ascend Snake River to the Great Shoshone Falls. When we crossed the river at Lewis Ferry, October 15, we saw several large sturgeon (*Acipenser transmontanus*) tied by the tails to stakes driven in the bank. One weighed fully 70 kilograms (150 pounds), and we were told by Mr. Lewis that he sometimes catches individuals weighing as much as 300 kilograms (600 pounds). He told us also that a fall run of salmon reached his place about October 1, and that the fish that do not die go back in November. We met a number of Shoshone or Bannock Indians on their way to the river to spear salmon. Some of them came all the way from the Lemhi Reservation.

A kind of mole cricket locally known as the Idaho Devil (*Stenopelmatus fasciatus*) is common on the Snake Plains in

October. It is a large wingless insect with a great yellow head, powerful jaws, and a banded abdomen. I first saw it in eastern Idaho in October, 1872, and found it common from Shoshone Falls and Lewis Ferry to the head waters of Bruneau River in October, 1890. It lives in burrows in the sage plains and its holes resemble those of the small pocket mice (*Perognathus olivaceus*) in being clean cut, going straight down at first, and having no mound at the opening. In crossing the plains during cold stormy weather the heads of these curious animals were often seen at the mouths of their burrows and many were met with walking about among the sagebrush. They walk much, with seeming dignity and deliberation, and their tracks may be seen in every direction. If two are held together they immediately bite off one another's legs and inflict other serious wounds.—From *Animal Life*.